pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, each two of which abut one another with their air gap boundary surfaces belonging to the first body at the joint edge arising in this way, and each coil side of the at least one air-core coil runs through the air gap with its air gap sections, with each edge changing its geometric form and thereby completing a bend or fold around the first body and each coil side running essentially in the air gap.

44. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body and in which each coil side of the at least one air-core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its air gap sections and essentially in the air gap.

45. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections lying close to one another, whose inner boundary surfaces approach closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body, and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the outer edge of the first body, and each coil side essentially runs in the air gap and the folded region of the coil is penetrated to a large extent by the field, in that in this part of the folded region at least one uniform and/or irregular air gap section delimits the conductor with magnetic poles affixed to at least one side.

46. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections lying close to one another, whose inner boundary surfaces approach closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body, and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the outer edge of the first body , and each coil side essentially runs in the air gap and all coil side sections of coil side within the respective air gap section are movable with essentially the same speed relative to the field device.

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47. An electrical machine according to claim 45, wherein the at least two air gap sections, in section transverse to the direction of movement, lie parallel to one another, and their inner boundary surfaces delimit a uniformly narrow first body.

48. An electrical machine according to claim 45, wherein the inner boundary surfaces of the at least two air-core coil sections comprise at least predominantly return path material.

49. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body and in which each coil side of the at least one air-core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its air gap sections and essentially in the air gap, and the at least one air gap section is in the shape of a circular arc.

50. An electrical machine according to claim 44, wherein, in section transverse to the direction of movement, the at least one curved air gap section is an irregular curve, and is elliptical.

51. An electrical machine according to claim 50, wherein, in section transverse to the direction of movement, the elliptical air gap section is a flat ellipse and thereby includes either one main apex and two secondary apexes or two main apexes and one secondary apex of the ellipse.

52. An electrical machine according to claim 43, wherein the air-core coil is located essentially within the air gap.

53. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, which, in section transverse to the direction of movement, are straight and lie at an angle of 90° to one another, whereby they intersect at one of their boundary surfaces, belonging to the first body, forming an angular edge of the first body, which is rounded off.

54. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which abut one another at a boundary surface which belongs to the first body, forming the edge, or abut at the outer edge, with one air gap section straight and one air gap section circularly curved.

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55. An electrical machine according to claim 45, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which transition directly into one another.

56. An electrical machine according to claim 43, wherein, in section transverse to the direction of movement, the air gap is assembled from three air gap sections, with two straight air gap sections lying in parallel connected through a third air gap section, which is either straight and lies at a 90° angle to each of them or is a curved air gap section.

57. An electrical machine according to claim 43, wherein the air gap, in section transverse to the direction of movement, comprises at least two air gap sections lying in parallel, with the boundary surfaces which abut at an edge comprising predominantly return path material and belonging to a narrow slot-shaped first body and the magnetic poles belonging to the air gap boundary surface of the second body.

58. An electrical machine according to claim 43, wherein, in section transverse to direction of movement, the air gap comprises several abutting air gap sections, each two of which abut at an edge or at an outer edge, which are straight or curved, and through which

each coil side of the at least one air-core coil runs, thereby completing at least one left bend and one right bend.

59. An electrical machine according to claim 58, wherein thereby at least three straight air gap sections lie, in section transverse to the direction of movement, parallel to one another.

60. An electrical machine according to claim 58, wherein the air gap, in section transverse to the direction of movement, comprises three straight air gap ctions, with two air gap sections lying parallel to one another, and the third air gap section assuming an angle of 90° to them.

61. An electrical machine according to claim 43, wherein a conductor of the air-core coil in the folded region in the region of the edge or outer edge is also at least partially penetrated by the magnetic field, with the magnetic field not running from one air gap boundary surface to the other in essentially a straight line.

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62. An electrical machine according to claim 43, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which contain, in their boundary surfaces which belong to the first body and abut one another, magnetic partial poles which, out over the joint edge or with an outer edge, form a joint continuous pole which is magnetized orthogonally to its air gap boundary surface.

63. An electrical machine according to claim 43, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, and the magnetic poles belong at least to different boundary surfaces of the air gap and the magnetic poles of the one air gap section, which belong to the boundary surface of the first body, lie with their faces at a distance to the return path material of the abutting, neighboring boundary surface of the other air gap section, which comprises at least predominantly return path material.

64. An electrical machine according to claim 56, wherein, in section transverse to the direction of movement, the air gap comprises at least three air gap sections, with two straight air gap sections lying in parallel connected by a straight third air gap section, and

magnetic poles belong to at least one of the two parallel boundary surfaces of the parallel air gap sections of the first body and are affixed to at least one of the sides of a slot-shaped return path body belonging to the first body and the boundary surface of the air gap section, which connects the two edges, in which one boundary surface of the air gap section abuts one of each of the air gap sections, comprises return path material and forms a flat return path of the first body, which is a return path flat band, which lies at a distance to the faces of the magnetic poles and is connected with the return path body approximately in the middle or on one edge, and an air gap boundary surface of the air gap section, to which magnetic poles belong, lies opposite to the return path flat band.

65. An electrical machine according to claim 45, wherein, in section transverse to the direction of movement, at least one second body in the folded region in the region of the edge at least partially follows the conductor or a curved coil trace at a uniform distance.

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66. An electrical machine according to claim 43, wherein at least one second body is connected via its edges lying in the direction of movement with a return path flat band which delimits the air gap on one side in the folded region in the region of an edge or outer edge.

67. An electrical machine according to claim 66, wherein the return path flat band carries, on the side toward the air gap, magnetic poles which extend transverse to the direction of movement, alternate in the direction of movement, and are magnetized in the direction of the first body, in the direction of the edge or outer edge.

68. An electrical machine according to claim 43, wherein it is composed of several machines which use a joint second body of the field device, which is implemented as a permanent magnet body, with it magnetized orthogonally to the direction of movement and to the air gap boundary surface and with both of the two pole surfaces of the magnet body delimiting at least one air gap section of the two electrical machines.

69. An electrical machine according to claim 43, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, which is a return path, at the outer edges of the opposing boundary surfaces of the air gap, with the second body having at least one continuous slot in the direction of movement,

for leading through the coil support, which divides the air gap boundary surface of the second body approximately in the middle in the direction of extension of the air gap and/or is located in a folded region of the at least one air-core coil.

70. An electrical machine according to claim 43, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, which is a return path, at the outer edges of the opposing boundary surfaces of the air gap, with the second body delimiting the air gap opposite to the first body and the coil support connected at the other outer edge of the air gap with a winding head or an inactive conductor region of the at least one air-core coil and led out of the air gap region.

71. An electrical machine according to claim 43, wherein the field device is surrounded by a housing or is itself the housing or part of the housing, and either the at least one air-core coil is securely connected with a shaft or axle, with the field device journaled directly and/or via a housing, or the at least one air-core coil is journaled directly and/or via a coil support and/or via a housing on the shaft or axle , and the field device is thereby securely connected with the shaft or axle.

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72. An electrical machine according to claim 43, wherein the movement is linear.

73. An electrical machine according to claim 43, wherein the movement of the field device and the at least one air-core coil is rotational relative to an axle or a shaft.

74. An electrical machine according to claim 57, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, whose boundary surfaces belonging to the first body abut at the outer edge of the first body, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, axially, extend in the direction of the axle, radially, and alternate around the periphery, and at least one air-core coil, each coil side of which changes its geometric form at the outer edge, and which is bent or folded around the first body, with this being a very thin disk-shaped body, at least in its peripheral region, with boundary surfaces which predominantly comprise return

path material, and a thin return path disk of uniform thickness, and each coil side on both sides of the first disk-shaped body extending into the air gap sections, approximately in the middle between each two disk-shaped bodies and at equal distances from them, in the direction of the axle or shaft, and connected in its region nearest the axle with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil.

75. An electrical machine according to claim 44, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, whose boundary surfaces belonging to the first body approach one another on at least one side closely enough that they are connected by a short outer edge and lie parallel to one another, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, axially, which extend in the direction of the axle, radially, and which alternate around the periphery, and at least one air-core coil, each coil side of which is bent or folded around the outer edge of the uniformly narrow cross-section of the first body, with this being, at least in the peripheral region, a very thin disk-shaped body with boundary surfaces predominantly comprising return path material, and being a thin return path disk of uniform thickness, with each coil side extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them and connected there with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil, and a large part of the folded region of the coil is penetrated by the field, in that in this part of the folded region at least a uniform and/or irregular air gap section with magnetic poles affixed on at least one side delimits the conductor.

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76. An electrical machine according to claim 43, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, which each run on one side of the first disk-shaped body

in the direction of the shaft or axle, and magnetic poles belong to at least one of the facing sides of the first and second disk-shaped bodies which are magnetized orthogonally to the air gap boundary surface, axially, which extend in the direction of the axle, radially, and which alternate around the periphery, with the first body comprising a slot-shaped return path body, which, in section transverse to the direction of movement, is very narrow, and magnetic poles which it carries on one of its sides, and the field device delimits a further air gap section in the peripheral region whose boundary surface belonging to the first body abuts each of the boundary surfaces also belonging to it of the neighboring air gap sections in each edge, and at least one air-core coil, with each coil side running at least partially through the air gap in the peripheral region and changing its geometric shape at both outer edges of the first body and bent or folded around the first body, extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them, and connected there with another coil side into an air-core coil, with the field device rotatable relative to at least one air-core coil and the first and second disk-shaped bodies thereby moving uniformly with one another, and a field device delimiting an air gap at least partially encloses a conductor along its length in the folded region in the region of at least one edge of the at least one air-core coil.

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77. An electrical machine according to claim 43, wherein the field device is located, at least in the form of at least two coaxial nested drum-shaped bodies at a distance from one another, on an axle or shaft, with each one first drum-shaped body located neighboring one second drum-shaped body and these, in section transverse to the direction of movement, each delimiting one air gap section, with two straight air gap sections or at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, which approaches the axle or shaft in at least one region, with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, and/or on an outer edge of the first body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances from them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are magnetized orthogonally to their air gap boundary surface, extend along the air gap in section transverse to the direction of movement, and alternate around the periphery, and

the field device rotates relative to the at least one air-core coil, with the first and second bodies of the field device securely connected and moving uniformly with one another.

78. An electrical machine according to claim 77, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing sides of the first and second body, on the face of the first body, which delimits an air gap section, containing magnetic poles, which are magnetized orthogonally to the air gap boundary surface and axially and which alternate around the periphery, and the edge is formed by the abutting boundary surfaces of the shell and face sides of the air gap section belonging to the first body, which lie orthogonal to one another, each coil side of the at least one air-core coil is bent or folded around it and it extends from there outward into the air gap section on the shell side, axially, and in the direction of the axle or shaft in the air gap section on the face side, radially or radially projected.

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79. An electrical machine according to claim 77, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing faces of the first and second body, which delimit an air gap section on one face of the first body and delimit an air gap section on its other face, containing magnetic poles, which are magnetized orthogonally to the air gap boundary surface and axially and which alternate around the periphery, with the air gap sections, in section transverse to the direction of movement, lying orthogonally to the air gap section, and the boundary surfaces, belonging to the first body, of one air gap section on the shell side and one air gap section on the face, each abutting in an edge of the first body, around which each coil side of the at least one air-core coil is bent or folded and extends from there axially into the air gap section on the shell side and radially or radially projected into the air gap sections on the face, each in the direction of the axle or shaft.

80. An electrical machine according to claim 77, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles, which are radially magnetized and alternate around the periphery, and the circular cylinder, in section transverse to the direction of movement, having faces slanted or bent inwards on at least one side toward the axle or shaft, with at least one of the facing faces of the first and second body, which delimits an air gap section on the face on at least one side of the first body, containing magnetic poles, which are magnetized orthogonally to the slanted or along the bending radius and which alternate around the periphery, and at least one edge formed by the abutting boundary surfaces belonging to the first body of the air gap sections on the shell side and face, in which each coil side of the at least one air-core coil changes its geometric shape and is bent or folded around the first body during its course through the air gap and extends axially into the air gap section on the shell side and into at least one air gap section on the face in the direction of the axle or shaft and radially projected.

81. An electrical machine according to claim 77, wherein the field device is in the form of at least three cylindrical bodies and the cylindrical body nearest the axle is a full or hollow cylinder and all further bodies are hollow cylinders and are nested in each other at a uniform interval at least on the shell side, with, in axial section, the boundary surfaces of one first body and one second body at a time delimiting one air gap section at a time, which each extend axially on the inner and outer shell surfaces of the first hollow cylinder, and at least one of the facing shell surfaces of the first and second cylindrical bodies has magnetic poles, which are radially magnetized, extend axially, and alternate around the periphery, and at least one of the facing faces of the first and second cylindrical bodies, which delimit an air gap section or a folded region on at least one side of the first body, also has magnetic poles, which are axially magnetized, extend in the direction of the axle or shaft, and alternate around the periphery, and each coil side of the at least one air-core coil is bent around at least one edge of a hollow cylindrical first body, which is formed by each two neighboring, abutting boundary surfaces of neighboring air gap sections or is bent or folded around an outer edge of the, in section transverse to the direction of movement, relatively uniformly narrow cross-section of the hollow cylindrical first body and extends axially from there outward on both sides of the edge or the outer edge of the, in the section transverse to the direction of movement, narrow cross-section of the hollow cylindrical first body, into an air

gap section on the face or on one side at a time into an air gap section on the face in the direction of the axle or shaft, radially or radially projected, and on the other side into an air gap section on the shell side, axially.

82. An electrical machine according to claim 43, wherein the field device comprises at least in the form of at least two long bodies, with each one first long body located neighboring one second long body, in section transverse to the direction of movement, and these each delimiting one air gap section, with two straight air gap sections or at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, with each coil side of the at least one air-core coil bent in its course through the air gap around at least one first body within at least one curved air gap section and/or changing its geometric shape at at least one edge and/or outer edge of the long first body and bent or folded around the first body, and extending over the complete air gap approximately centrally between the first and second body and at approximately the same distance from each of them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are magnetized orthogonally to their air gap boundary surface, extend, in section transverse to the direction of movement, along the air gap, and alternate around the periphery, and the field device moves linearly relative to at least one air-core coil, with the first and second bodies of the field device securely connected and moving together uniformly.

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83. An electrical machine according to claim 82, wherein the long bodies are at least three long, plate-shaped bodies of a small, uniform thickness, which lie at uniform intervals from one another, with an air gap section located between each first plate-shaped body and second plate-shaped body, and the air gap sections lying parallel to one another in section transverse to the direction of movement, with the plate-shaped bodies being long relative to their width and the long sides lying in the direction of movement and magnetic poles belonging to at least one of the facing sides of the first and second plate-shaped bodies which extend transverse to the direction of movement and are magnetized orthogonally to the surface of the plate-shaped body delimiting the air gap, and the boundary surfaces belonging to the first body, which has, in section transverse to the direction of movement, a uniformly narrow surface, two neighboring air gap sections abut one another on one long side at the outer edge, around which each of the coil sides of the at least one air-core coil is bent or folded, and extends from this folded region into the air gap section, and is connected, in the